



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.06.2012 Bulletin 2012/25

(51) Int Cl.:
A61M 16/06 ^(2006.01) **A61M 16/08** ^(2006.01)
A61M 39/10 ^(2006.01)

(21) Application number: **10195021.0**

(22) Date of filing: **14.12.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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(54) **Facial mask for treating sleep disorders with locking means for blocking the rotatable gas connector**

(57) A respiratory mask, such as a facial mask, comprising a mask body (1) with an internal chamber (2) and a gas inlet orifice (3) in fluid communication with said internal chamber (2), and a hollow connector (4) connected to said gas inlet orifice (3) so that the internal passage (5) of the hollow connector (4) is in fluid communication with said internal chamber (2), said hollow connector (4) being rotatable. The hollow connector (4) is further mobile in translation along the axis (AA) of the

gas inlet orifice (3) between at least a first axial position, wherein the connector can freely rotate around axis (AA) and a second axial position, wherein the connector is locked in a fixed position and can not freely rotate around said axis (AA). Further, locking means are provided for locking and for maintaining the hollow connector (4) blocked in said second axial position. The mask of the invention is suitable for treatment of respiratory disorders, such as obstructive sleep apnea (OSA).

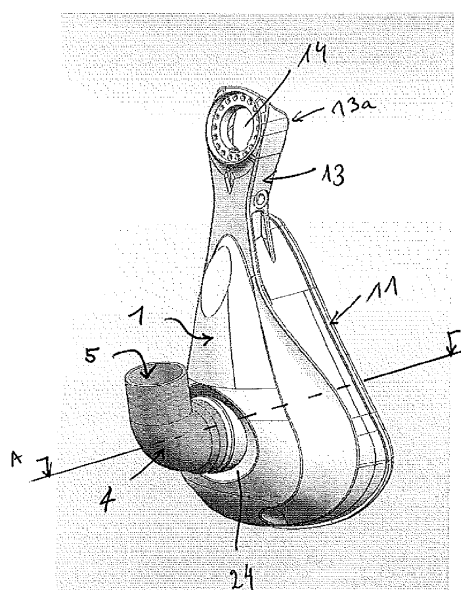


FIG. 2

Description

[0001] The invention concerns a respiratory mask, in particular a facial mask, for use in the treatment of respiratory conditions or diseases, such as obstructive sleep apnea. The respiratory mask comprises a rotating elbow-connector that is able to rotate with respect to the mask body.

[0002] Masks, such as facial or nasal masks, are commonly used for delivering non-invasive positive pressure ventilation (NPPV) or for nasal continuous positive airway pressure (N-CPAP) therapy in sleep disordered breathing (SDB) conditions, such as obstructive sleep apnea (OSA). They typically deliver a flow of breathable gas for, or to assist in, patient respiration, especially during the night, i.e., when the patient is sleeping.

[0003] Such a mask assembly typically comprises a rigid or semi-rigid hollow shell, also called a mask body, defining a breathing chamber that receives at least a part of the patient's nose and/or mouth, and further comprising a soft face-contacting cushion that comes into contact with the patient's face, and a forehead support that is either pivotable or not pivotable and a headgear for correctly positioning, maintaining and/or securing the mask on the head of a patient. The shell of the mask or mask body is connected to a gas supply line which delivers a respiratory gas, such as air under pressure, into the breathing chamber of the shell through a gas opening or inlet orifice arranged in the wall of the mask body. The connection between the gas line and the mask body is usually obtained by means of a hollow connector comprising an internal passage for the gas. The connector can have an elbow-shape, i.e. be curved, or any other shape.

[0004] A rotatable connector that rotates around the axis of the inlet orifice is known to be used to correctly position the gas line, which is typically a flexible conduit, with respect to the mask.

[0005] The problem that exists with such rotatable connectors, is that they can rotate while the patient is sleeping, thereby causing a bad gas seal of the mask on the patient's face and thus leading to gas leaks. While attempts for modifying the existing connectors have been made, so far the resulting masks are not totally satisfying. Hence, the problem to be solved is to provide an improved mask, especially a facial mask, for allowing an easy and efficient angular positioning of the tubing elements, i.e. the flexible conduit, and of the connector with respect to the mask body so as to limit the risks of creating gas leaks while the patient is sleeping.

[0006] The solution that the present invention provides is a respiratory mask, such as a facial mask covering the patient's nose and mouth, comprising a mask body with an internal chamber and a gas inlet orifice, said gas inlet orifice having an axis (AA) and being in fluid communication with said internal chamber, and a hollow connector with an internal gas passage being connected to said gas inlet orifice so that the internal passage of the hollow

connector is in fluid communication with said internal chamber, said hollow connector being rotatable around the axis (AA), characterized in that :

- 5 - the hollow connector is further mobile in translation along the axis (AA) between at least a first axial position, wherein the connector can freely rotate around said axis (AA), and a second axial position, wherein the connector is locked in a fixed position and can not rotate around said axis (AA),
- 10 - and the mask further comprises locking means for locking and for maintaining the hollow connector blocked in said second axial position.

15 **[0007]** The mask according to the present invention can further comprise one or more of the following additional features:

- a hollow connector that is elbow-shape.
- 20 - locking means comprising lips, at least one abutment and at least a notch.
- locking means comprising several lips and at least one abutment carried by the hollow connector, and an inner lip and at least one notch carried by the mask body.
- 25 - the inner lip and the at least one notch are arranged on a tubular element carried by the mask body, the gas inlet orifice traversing said tubular element.
- several lips carried by long and short fingers arranged on the hollow connector.
- 30 - at least one abutment carried by the hollow connector that has a shape that matches at least one notch carried by the mask body so that said abutment at least partially penetrates into said notch for blocking the rotation of the hollow connector around axis (AA) when the hollow connector is in said second axial position.
- 35 - locking means comprising nipples, a second groove and several wall portions arranged in said second groove so as to form a plurality of lodgings in said second groove.
- 40 - wall portions are arranged in said second groove so as to form a plurality of angularly distributed lodgings in said second groove, said second groove being arranged in the external peripheral wall of the tubular element.
- 45 - nipples arranged on fingers of the connector.
- a first groove annularly arranged in the external wall of the tubular element, between the peripheral border of said tubular element and the second groove.
- 50 - when the connector is in the first axial position, the nipples are positioned in the first groove.
- the mask is a facial mask.
- an internal chamber comprising a peripheral border and a cushion being fixed to said peripheral border, said cushion having a central aperture for receiving at least part of the patient's nose and/or mouth.
- 55 - the mask further comprising a forehead support, a

headgear and fixing means for fixing the headgear to the mask body, such as hooks, buckles or similar.

- the forehead support arranged on a holding arm connected to an expansion part of the mask body, and a rotating knob that allows for modification of the angular position of the holding arm when said rotating knob is operated/rotated by a user.
- an expansion part projecting upwardly and further integral with the mask body, preferably the expansion part and the mask body being molded in one piece.
- the forehead support comprising one or several pillows of soft material wherein said pillows come into contact with the forehead of the user.
- the hollow connector comprising an anti-asphyxia valve.
- the cushion arranged on the peripheral border of the internal chamber comprising one or several flexible membranes, preferably two superimposed membranes ensuring an efficient air tightness so as to minimize air leaks.

[0008] Two embodiments of a facial mask according to the present invention are shown in the enclosed Figures, among which :

- Figure 1 represents a facial mask according to the present invention,
- Figures 2-8 show a first embodiment of locking means and connector of a facial mask of the present invention, and
- Figures 9-15 represent a second embodiment of locking means and connector of a facial mask of the present invention

[0009] As illustrated in the Figures, a respiratory facial mask according to the present invention comprises a rigid or semi-rigid hollow shell or mask body 1 defining an internal breathing chamber 2 or volume, wherein respiratory gas, such as air under pressure, is introduced via an inlet port 3 which is connected a gas feeding line, such as a flexible gas conduit, by means of a tubular hollow connector 4. Preferably, the connector 4 has a general elbow-shape and comprises an internal passage for the gas.

[0010] The gas inlet orifice 3 is arranged at the center of the mask body 1 and through the wall of the mask thereby allowing air under pressure to be introduced in the breathing chamber 2 that receives the nose and mouth of the patient.

[0011] The mask body 1 is preferably made of a polymer material, such as polycarbonate (PC), polypropylene (PP), ABS, nylon or polystyrene (PS), and is configured so as to be able to receive at least a part of the patient's nose. In other words, the patient introduces his/her nose and mouth into the internal volume of the breathing chamber 2 of the mask body 1 and breathes the pressurized gas contained therein. The mask body 1 preferably has

a general triangular or quasi-triangular three-dimensional shape as shown in Figure 1, for example.

[0012] The mask body 1 further comprises an expansion part 13 arranged on the top of the mask body 1 and projecting upwardly from said mask body 1, i.e. projecting away from the external surface of the mask body 1. The expansion part 13 comprises a traversing orifice 14 that is preferably located at the distal end 13a of the expansion part 13. Preferably, the mask body 1 and the expansion part 13 are made of polymeric material that is molded in one piece so as to obtain an expansion part 13 that is integral with the rest of the mask body 1.

[0013] Further, as represented in Figure 1, a forehead support 15 is connected to the mask body 1 by means of a pivotable holding arm fixed to or carried by either the mask body 1 or the expansion part 13, preferably the expansion part 13. The forehead support 15 can comprise one or several pillows 16 of soft and comfortable material that come into contact with the patient's forehead.

[0014] An acting piece (not visible in Fig. 1) is arranged in the traversing orifice 14 of the expansion part 13 and is mobile, preferably in translation, in said traversing orifice 13 so as to cooperate with the holding arm for pivoting said holding arm when said acting piece moves in the traversing orifice 14 of the expansion part 13. Further, the forehead support 15 can also pivot with respect to the holding arm 13. Actually, the back or forward motion of the acting piece in the traversing orifice 14 is obtained by manual rotation by the user of a rotating knob 17 cooperating with the acting piece—when said rotating knob 17 is manually operated, i.e. turned clockwise or counterclockwise, by the user. The maximum course of the knob 6 is about 360° or less.

[0015] Furthermore, in order to ensure a tight positioning of the nasal mask on the patient's face and to increase the comfort for the patient, the peripheral border or edge 11 of the mask body 1 comprises a cushion 12 made of soft, resilient, elastomeric material that comes into contact with the patient's face. Said cushion 12 has a central aperture for receiving at least a part of the patient's nose. More precisely, the border 11 and the cushion 12 have a general triangular or saddle-shape structure so as to match the contours of the nasal region including the upper nasal bridge region, the cheek regions on both sides of the nose, and the lower chin region of the patient. The cushion 12 can comprise one or several membranes, preferably two membranes. Such cushion 12 and mask body 1 structures are well-known in the art and taught by many documents, such as EP-A-1334742, EP-A-264772, EP-A-956069, EP-A-874667, US-A-2,931,356 or EP-A-1479406.

[0016] Furthermore, a headgear 17 comprising straps can be connected to the mask body 1, by fixing means 18 such as hooks and slots cooperating together, for fixing the straps of the headgear and thereby maintaining the mask in the selected position on the head of the patient during the use of the mask and thus obtain an effi-

cient treatment of sleep disorders, such as OSA or similar disorders. The headgear-fixing means 18 can be made integral with the shell 1 body. Such structures are well known in the art and disclosed in many documents, such as, for example, EP-A-1334742, EP-A-462701, EP-A-1985327 or EP-A-956069.

[0017] The shell or mask body 1 is fluidly linked to a gas supply line, such as a flexible hose or conduit conveying respiratory gas to the mask, by means of a tubular hollow connector 4 which delivers the respiratory gas, such as air under pressure, into the breathing chamber 2 of the shell 1 through a gas inlet 3 arranged in the mask body 1 as represented in Figures 2, 3, 5 and 8. More precisely, the tubular connector 4, that can be made of polymer material, has a circular section and preferably an elbow or curved form as shown in Figure 4.

[0018] According to the present invention, the hollow connector 4 is rotatable, i.e. can freely turns around the axis AA of the inlet orifice 3, as shown in Figures 2, 3 and 5, or can be locked, i.e. blocked, in a desired fixed angular position so that the rotation of the hollow connector is not possible around the axis AA. Actually, the hollow connector 4 is rotatable around axis AA as well as moveable in translation on axis AA, i.e. back and forward vis-a-vis the mask body 1, between at least a first position wherein the hollow connector can freely rotate around said axis AA and at least a second position where no rotation is allowed, i.e. the connector 4 is blocked in rotation. In other words, for locking the connector 4 in a given or desired angular position around axis AA, the user should first put the connector 4 in the first axial position of the connector 4 (if the connector 4 is not already in that first axial position), then rotate the connector 4 to get the desired angular position and then exert a manual pressure on the connector 4 so as the connector 4 translates forward on axis AA in the direction of the mask body 1 to its second axial position. Hence, the connector 4 is locked in said second axial position and thereby has been locked into its angular position. Locking means or a locking system are used for locking and maintaining the hollow connector 4 in said second axial position so as to prohibit any free rotation of the connector around axis AA.

[0019] A first embodiment of possible locking means is shown in Figures 2-8. Said locking means comprises particular structures cooperating together which are carried, on the one hand, by the inlet orifice 3 and, on the other hand, by the hollow connector 4. More precisely, in this first embodiment, as shown in Fig. 3, the inlet orifice 3 has a three-dimensional shape as the inlet orifice 3 is formed by a tubular element 20 of axis AA, projecting outwardly of the external surface of the mask body 1. Further, said tubular element 20 is preferably made integral with the mask body 1, for instance by molding in one piece. Furthermore, said tubular element 20 comprises one or several cuts or the like made in the outer peripheral border 23 of the tubular element 20 so as to form one or several notches 21. The internal cylindrical surface of the tubular element 20 carries an inner lip 22

having a semi-cylindrical shape that is used for retaining the connector 4 in its first position as detailed below.

[0020] The hollow connector 4 also has a particular structure that is complementary to the structure of the inlet orifice 3 so that both structures can cooperate together. More precisely, as shown in Fig. 4, the proximal end 4a of the connector 4 that cooperates with the inlet orifice 3 comprises several long fingers or strips 30 projecting outwardly with respect to the peripheral border or edge 34 of the proximal end 4a of the connector 4. Further, the proximal end 4a of the connector 4 also comprises several short fingers or strips 32 that also project outwardly with respect to the peripheral border or edge 34 of the proximal end 4a of the connector 4. Each of said long and short fingers or strips 30, 32 is fixed by its distal end to the proximal end 4a of the hollow connector 4 and further carries an external lip 31 on its outer surface forming, at its distal end, a small abutment radially-oriented toward the exterior of the hollow connector 4. The short fingers or strips 32 have a length that is shorter than the one of the long fingers 30, for instance the length of the short fingers is from about 3 to 6 mm, whereas the length of the long fingers 30 is from about 6 to 12 mm. Preferably, the connector 4 comprises between 2 and 20 long and short fingers 30, 32, typically about 4 of each.

[0021] More preferably, the long and short fingers 30, 32 are arranged in an alternate way as represented in Figure 4, i.e. each long finger 30 is positioned between 2 short fingers, and reciprocally, while being spaced by free spaces 36 like the crenels of a castle.

[0022] Further, the hollow connector 4 also carries on its peripheral external surface one (or several) abutment 35 and preferably a peripheral ring 33 comprising a front edge 37 that comes into contact with the outer peripheral border 23 of the tubular element 20 when the connector 4 is in its second position as explained below. The abutment 35 is dimensioned so as to have a form and size that matches the form of the notch(es) 21 of the tubular element 20.

[0023] The short fingers 32, long fingers 30, ring 33 and abutment 35 are preferably made in one-piece by molding with the rest of the connector 4. Preferably, the short fingers 32 and the long fingers 30 are made of a resilient material that is flexible or at least slightly deformable, such as a polymer material, e.g. polycarbonate (PC), polypropylene (PP), ABS, nylon or polystyrene (PS), or similar material.

[0024] The outer diameter of the proximal end 4a of the hollow connector 4 has a shape and size that matches the inner wall of the tubular element 20, for instance an outer diameter of between about 10 and 50 mm. When the proximal end 4a of the hollow connector 4 is inserted into the tubular element 20 so that it is in its first axial position along the axis AA, it is retained therein by the lips 31 of the long fingers 30 that come in abutment against the inner lip 22 of the tubular element 20 as shown in Figures 5 and 6.

[0025] In the first position, the connector 4 can freely

rotate around the axis AA so as to occupy a desired angular position around said axis AA. For instance, Figures 5 and 6 illustrate the connector 4 oriented in two different angular positions spaced 180° around the axis AA for a connector 4 in its first position along the axis AA. In the first axial position, the abutment 35 does not engage, i.e. penetrate into, the notch 21 as shown in Fig. 6.

[0026] Once the connector 4 has been placed in the desired angular position of Figure 6, by motion around the axis AA, i.e. by rotation, the user can exert on said connector 4 a manual pressure so as to get a translation of the connector 4 along the axis AA thereby reaching its second axial position along the axis AA. Actually, operating such a translation of the connector 4 along the axis AA involves a translation motion of the connector 4 axially in the direction of the mask body 1. This involves a motion of the short fingers 32 in the direction of the inner lip 22 of the tubular element 20 as shown in Figure 7 and further the abutment 35 penetrates into the notch 21 of the tubular element 20. The external lip 31 of each of the short fingers 32 comes first into contact with the inner lip 22 of the tubular element 20 and then, as short fingers 32 are made of resilient material, the external lips 31 of the short fingers 32 pass above said inner lip 22 and come in abutment with the other side of said inner lip 22, as shown in Figure 8, so as to retain the connector 4 blocked and locked in the second axial position. Meanwhile, the abutment 35 that is lodged into the notch 21 of the tubular element 20 avoids or prohibits any angular motion, i.e. rotation of the connector 4 with respect to the mask shell 1. Further, the course of the connector 4 in the direction of the mask body 1 is limited by the annular ring 33 that comes in abutment with the outer peripheral border 23 of the tubular element 20 as represented in Figure 8.

[0027] A second embodiment of the locking means of the invention is shown in Figures 9-15. Here again, the locking means comprises particular structures cooperating together which are carried, on the one hand, by the inlet orifice 3 and, on the other hand, by the hollow connector 4. More precisely, in this second embodiment, as shown in Figure 9, the inlet orifice 3 has a three-dimensional shape as it is formed, here again, by a tubular element 20 of axis AA, projecting outwardly of the external surface of the mask body 1, which tubular element 20 is preferably arranged in a lodging 24 in recess formed in the outer surface of the mask. Said tubular element 20 is preferably made integral with the mask body 1, for instance, by molding in one piece.

[0028] In this second embodiment, as detailed in Figures 10-11, the tubular element 20 comprises two successive peripheral grooves 50, 51, i.e. annular recesses, made in the outer peripheral wall of the tubular element 20, said grooves 50, 51 having roughly the same shape. The first groove 50 is located between the outer peripheral border 23 of the tubular element 20 and the second groove 51, whereas the second groove 51 is arranged between the first groove 50 and a shoulder 54 situated around the peripheral external surface of the tubular el-

ement 20, i.e. close to the body 1 of the mask.

[0029] In the second groove 51 are arranged a plurality of little wall portions 52, e.g. 16 wall portions, that are radially and outwardly projecting so as to divide the second groove 51 in a plurality of little lodgings 55, e.g. 16 lodgings, each formed by a portion of the second groove 51 and delimited said wall portions 52, as illustrated on Figures 11 and 14. The little wall portions 52 are angularly distributed, in a regular manner, all along the annular second groove 51. Further, the hollow connector 4 has also in this case a particular structure that fits the structure of the inlet orifice 3 so that both structures can cooperate together. More precisely, the internal cylindrical surface of the hollow connector 4 carries an inner annular lip 43 having a semi-cylindrical shape that is used for retaining the connector 4 in its first and second axial position along the axis AA, and for ensuring that no air is lost between the connector 4 and the inlet orifice 3, as shown in Figures 12, 13 and 15.

[0030] Furthermore, as illustrated in Figure 12, the proximal end 4a of the connector 4 that cooperates with the inlet orifice 3 comprises several fingers or strips 40, e.g. 3 fingers 40, projecting outwardly with respect to the peripheral border or edge 34 of the proximal end 4a of the connector 4. Each of said fingers or strips 40 is fixed by its distal end to the proximal end 4a of the hollow connector 4 and comprises at the proximal end of the fingers or strips 40 a nipple 41 having a shape that fits with the shape of the little lodgings 55 formed in the second groove 51. Preferably, the connector 4 comprises between 2 and 20 fingers 40, typically between 2 and 10. The fingers 40 and nipples 41 are preferably made in one-piece by molding with the rest of the connector 4. Hence, they are advantageously made of a resilient material that is flexible or at least slightly deformable, such as a polymer material, e.g. polycarbonate (PC), polypropylene (PP), ABS, nylon or polystyrene (PS) or similar.

[0031] The outer diameter of the proximal end 4a of the hollow connector 4 has a shape and size that matches the inner wall of the tubular element 20, for instance, an outer diameter of between about 10 and 50 mm. When the proximal end 4a of the hollow connector 4 is connected to the tubular element 20 so that it is in the first axial position along the axis AA, the proximal end 4a is retained therein by the nipples 41 that are lodged in the first groove 50 of the tubular element 20, as shown in Figure 13.

[0032] In the first axial position, the connector 4 can freely rotate around the axis AA so as to occupy a desired angular position around said axis AA. For instance, Figures 13 and 15 illustrate the connector 4 oriented in two different angular positions spaced 180° around the axis AA for a connector 4 in its first position along the axis AA. In the first axial position, the nipples 41 do not engage, i.e. penetrate into, the lodgings 51 of the second groove 51 as shown in Figure 13.

[0033] Once the connector 4 has been placed in the desired angular position of Figure 15, by rotation around the axis AA, the user can exert on said connector 4 a

manual pressure so as to get a translation of the connector 4 along the axis AA, in the direction of the mask body 1, thereby reaching its second axial position along the axis AA. Actually, operating such a translation of the connector 4 along the axis AA involves a translation motion of the connector 4 axially in the direction of the mask body 1. This involves a motion of the fingers 40 carrying the nipples 41, in the direction of the second groove 51 of the tubular element 20 and further their penetration into the lodgings 55 formed in the second groove 51. The nipples 41 are then retained in said lodgings 55, thanks to the wall 53 separating the first and the second grooves 50, 51 and the course in translation toward the mask body 1, is blocked by the annular shoulder 54 of the tubular element 3 against which abuts the peripheral border or edge 34 of the proximal end 4a of the connector 4. The connector 4 is thus in its second axial position and is blocked in rotation and locked in translation in said second axial position thanks to the cooperation of the nipples 41 with the lodgings 55 of the tubular element 3. This avoids any angular motion, i.e. rotation of the connector 4 with respect to the mask shell 1.

[0034] A particular feature of the second embodiment of the mask is that, depending on the height or size chosen for the wall portions 52, when it is in the second position along the axis AA, the connector 4 can be either totally blocked (i.e., important size/height of the wall portions 52) or still be rotatable around the axis AA (i.e., medium size/height of the wall portions 52), when exerting a rotation force on said connector. In the latter case, the connector can not however rotate freely as its rotation requires a minimum rotation force exerted by the user and applied on the connector, i.e., a voluntary rotational motion around the axis AA. The facial mask of the present invention can be used in a method for treatment of a respiratory disorder or condition, for example, in non-invasive positive pressure ventilation (NPPV) or in a continuous positive airway pressure (CPAP) therapy of sleep disordered breathing (SDB) conditions, such as, for example, obstructive sleep apnea (OSA).

Claims

1. Respiratory mask comprising a mask body (1) with an internal chamber (2) and a gas inlet orifice (3), said gas inlet orifice (3) having an axis (AA), said gas inlet orifice (3) being in fluid communication with said internal chamber (2), and a hollow connector (4) with an internal gas passage (5) being connected to said gas inlet orifice (3) so that the internal passage (5) of the hollow connector (4) is in fluid communication with said internal chamber (2), said hollow connector (4) being rotatable around the axis (AA), **characterized in that:**

- the hollow connector (4) is further mobile in translation along the axis (AA) between at least :

a first axial position, wherein the connector can freely rotate around said axis (AA) and a second axial position, wherein the connector is locked in a fixed position and can not rotate around said axis (AA),

- and the mask further comprises locking means for locking and for maintaining the hollow connector (4) blocked in said second axial position.

2. Respiratory mask according to Claim 1, **characterized in that** the hollow connector (4) has an elbow-shape.
3. Respiratory mask according to any one of the preceding Claims, **characterized in that** the locking means comprise lips (22, 31), at least one abutment (35) and at least a notch (21).
4. Respiratory mask according to any one of the preceding Claims, **characterized in that** the locking means comprise several lips (31) and at least one abutment (35) carried by the hollow connector (4) and an inner lip (22) and at least one notch (21) carried by the mask body (1).
5. Respiratory mask according to any one of the preceding Claims, **characterized in that** the inner lip (22) and the at least one notch (21) are arranged on a tubular element (20) carried by the mask body (1), the gas inlet orifice (3) traversing said tubular element (20).
6. Respiratory mask according to any one of the preceding Claims, **characterized in that** several lips (31) are carried by long and short fingers (30, 32) arranged on the hollow connector (4).
7. Respiratory mask according to any one of the preceding Claims, **characterized in that** at least one abutment (35) carried by the hollow connector (4) has a shape that matches at least one notch (21) carried by the mask body (1) so that said abutment (35) at least partially penetrates into said notch (21) for blocking the rotation of the hollow connector around axis (AA), when the hollow connector (4) is in said second axial position.
8. Respiratory mask according to Claims 1 or 2, **characterized in that** the locking means comprise nipples (41), a second groove (51) and several wall portions (52) arranged in said second groove (51) so as to form a plurality of lodgings (55) in said second groove (51).
9. Respiratory mask according to Claim 8, **characterized in that** the wall portions (52) are arranged in said second groove (51) so as to form a plurality of angularly distributed lodgings (55) in said second

groove (51), said second groove (51) being arranged in the external peripheral wall of the tubular element (20).

10. Respiratory mask according to any one of the Claims 1, 2, 8 and 9, **characterized in that** the nipples (41) are arranged on fingers (40) of the connector (4). 5
11. Respiratory mask according to any one of Claims 1, 2 and 8 to 10, **characterized in that** a first groove (50) is annularly arranged in the external wall of the tubular element (20), between the peripheral border (23) of said tubular element (20) and the second groove (51). 10
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12. Respiratory mask according to Claim 11, **characterized in that** when the connector (4) is in the first axial position, the nipples (41) are positioned in the first groove (50). 20
13. Respiratory mask according to any one of the preceding Claims, **characterized in that** the respiratory mask is a facial mask.
14. Respiratory mask according to any one of the previous claims, **characterized in that** the internal chamber (2) comprises a peripheral border (11) and a cushion (12) being fixed to said peripheral border (11), said cushion (12) having a central aperture for receiving at least part of the patient's nose and/or mouth. 25
30
15. Respiratory mask according to any one of the preceding Claims, **characterized in that** the respiratory mask further comprises a forehead support (9), a headgear and fixing means (19, 20) for fixing the headgear to the mask body (1). 35
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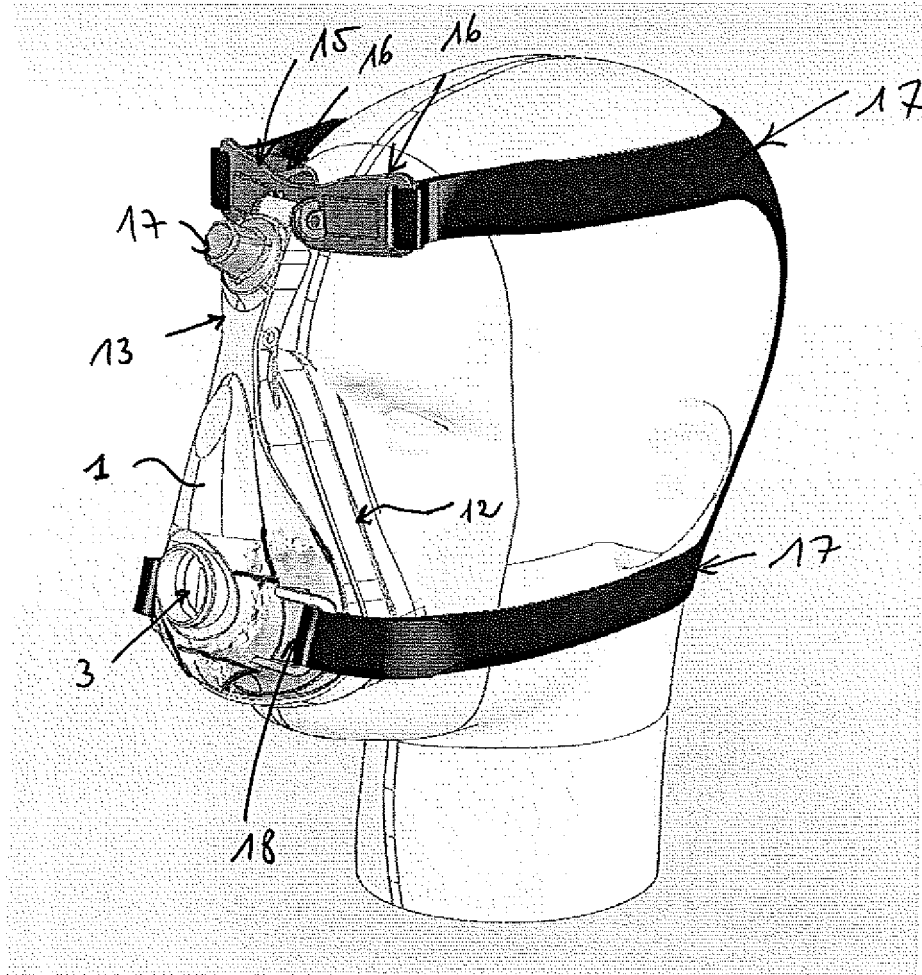


FIGURE 1

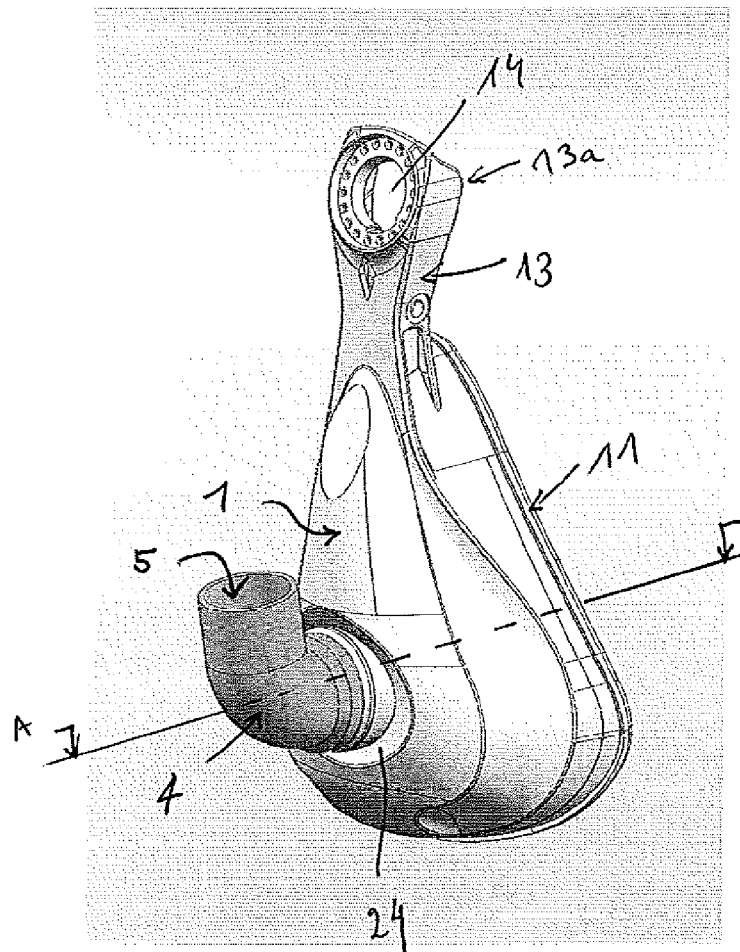


FIG. 2

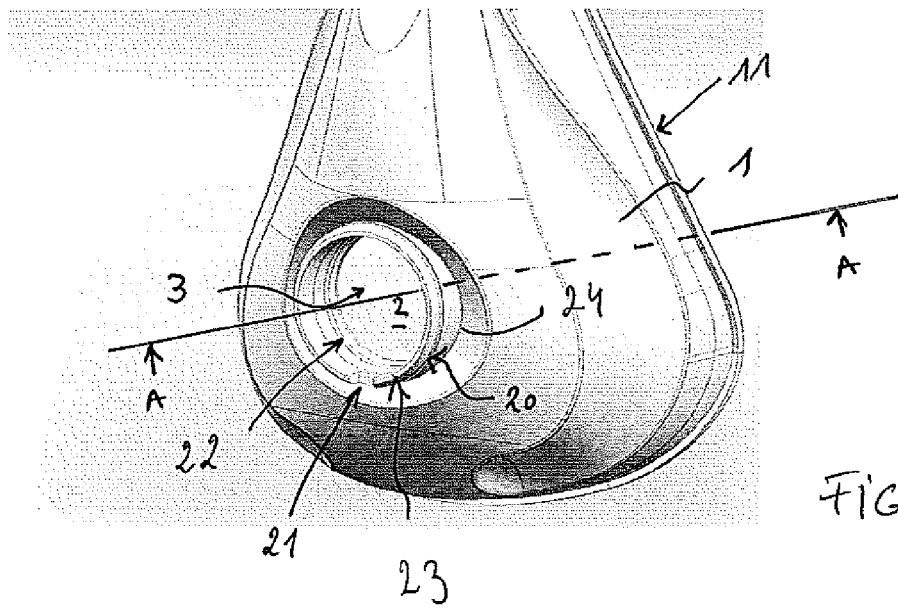
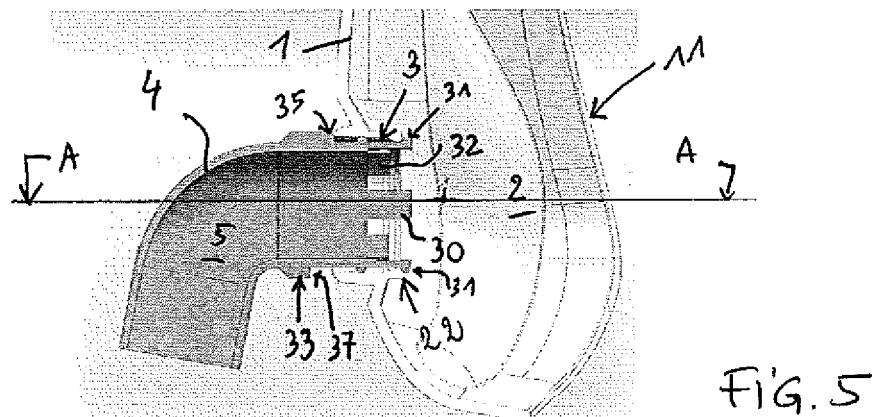
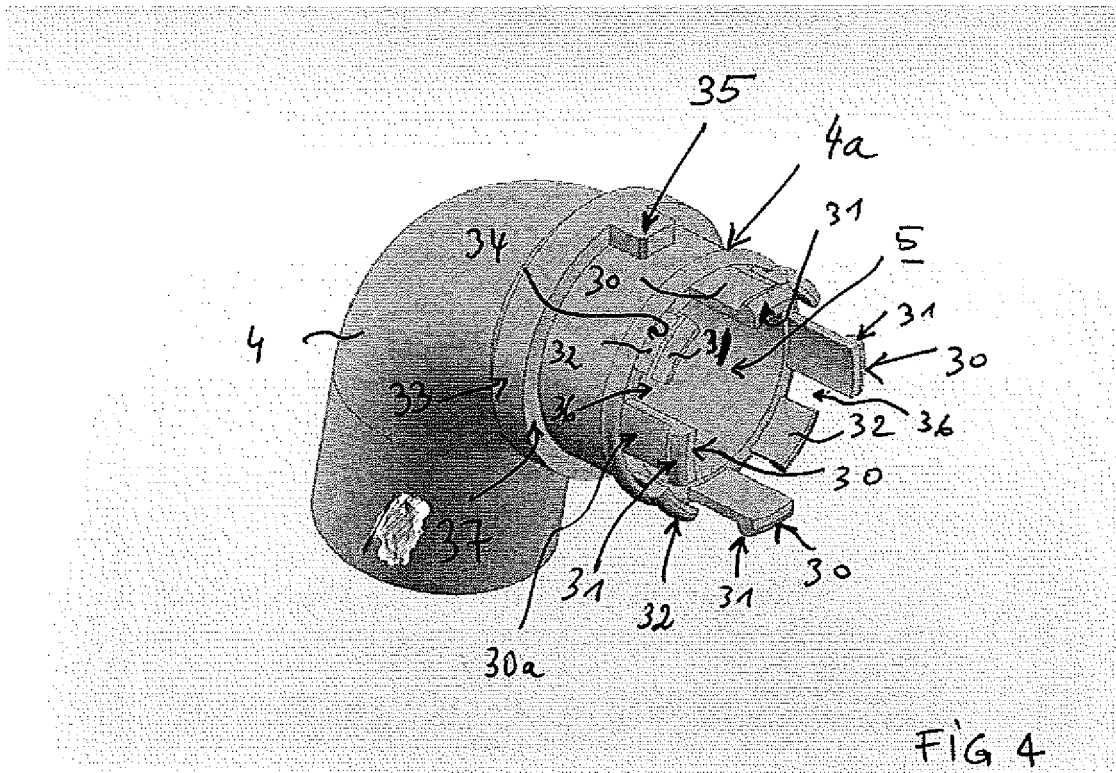


FIG. 3



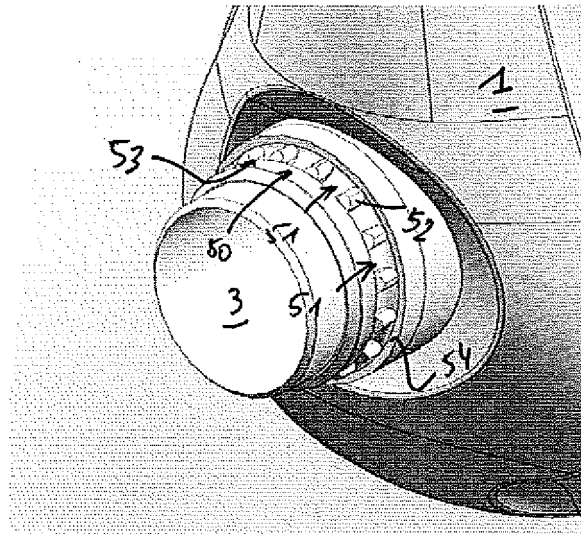


FIG. 10

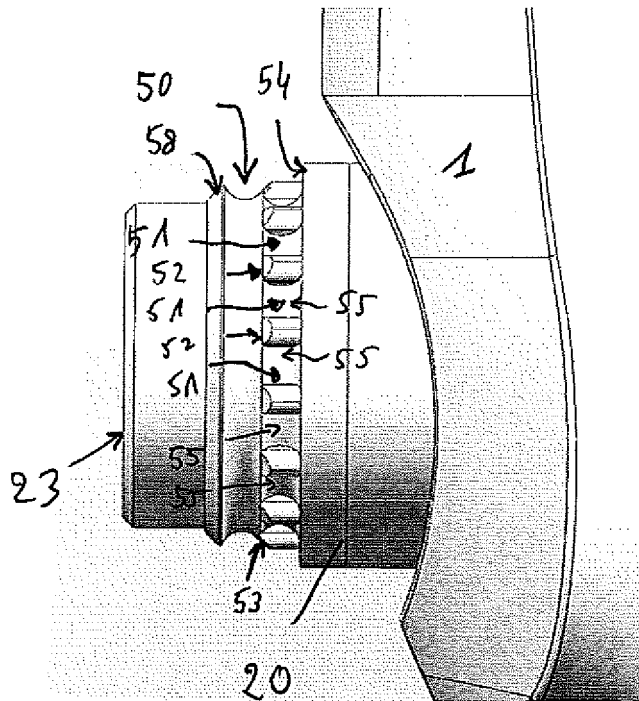


FIG. 11

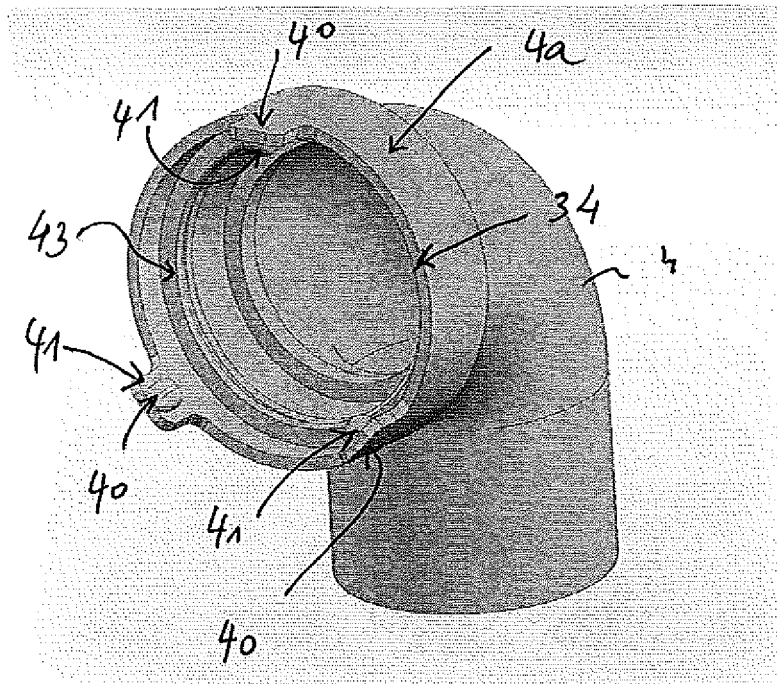


FIG. 12

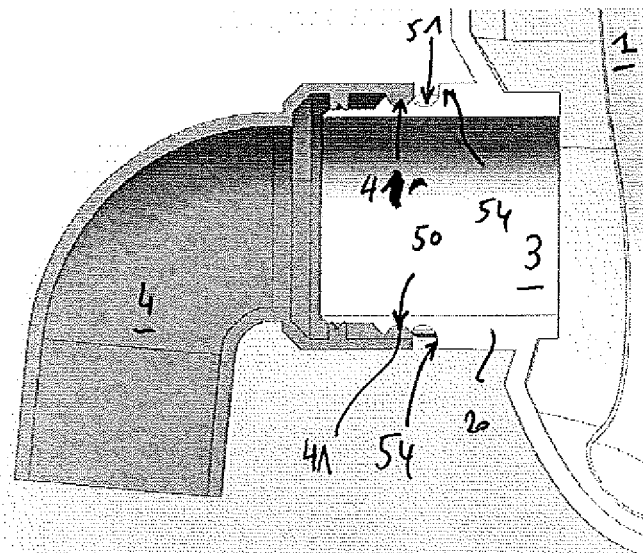


FIG. 13

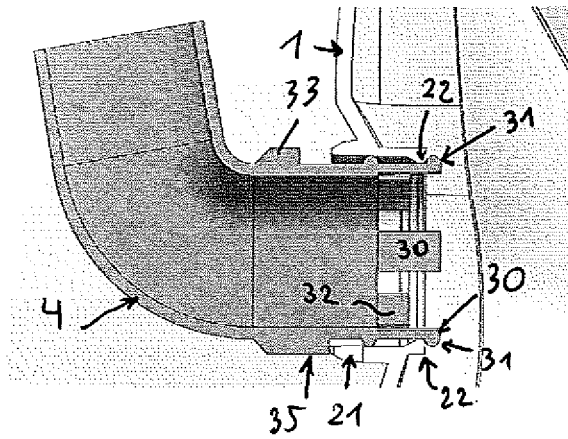


FIG. 6

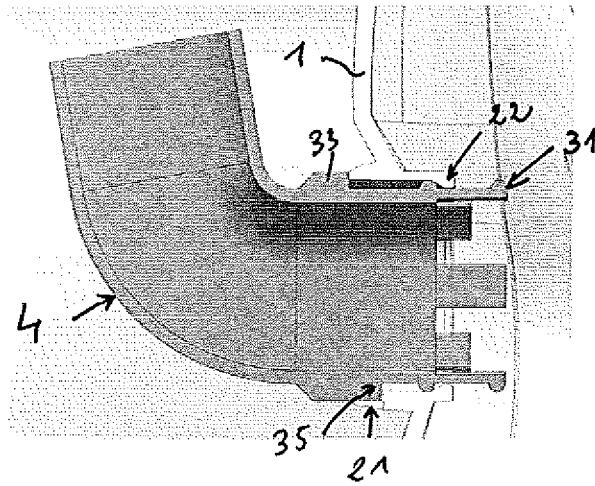


FIG. 7

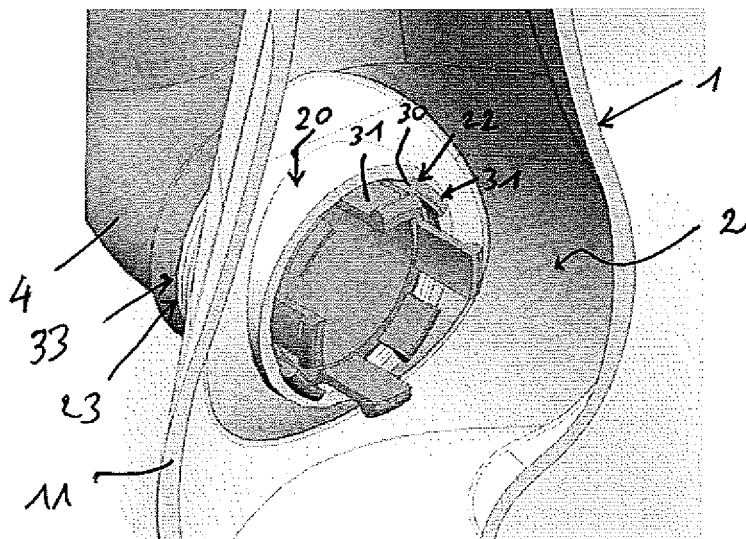


FIG. 8

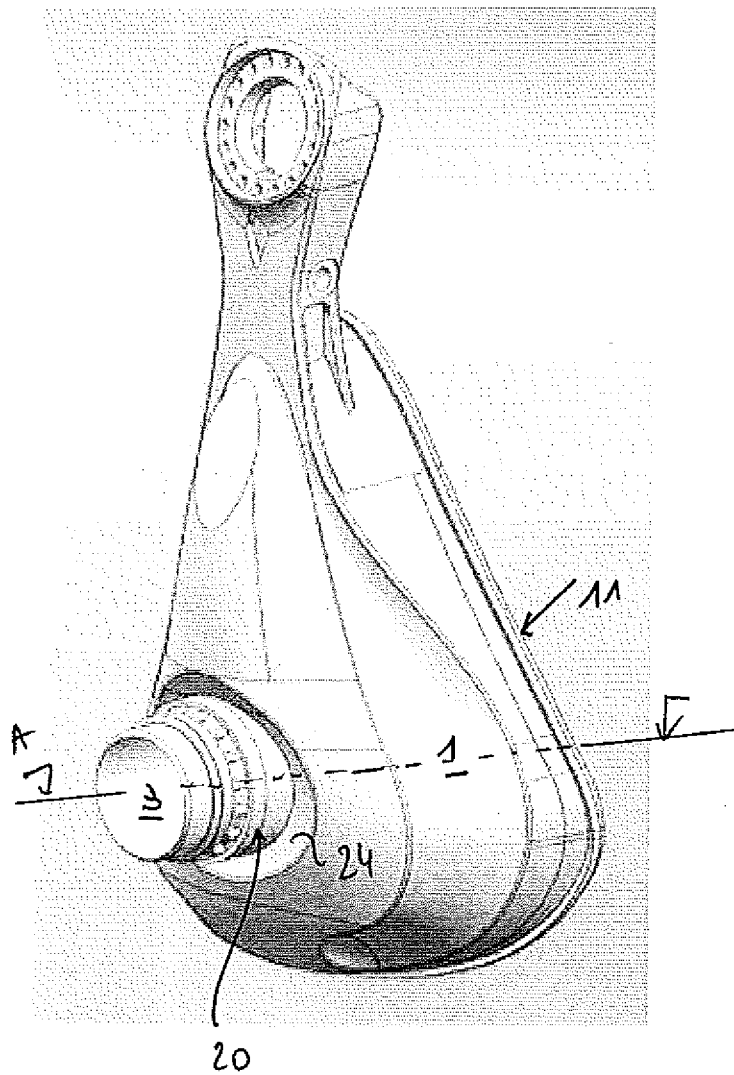


Fig. 9

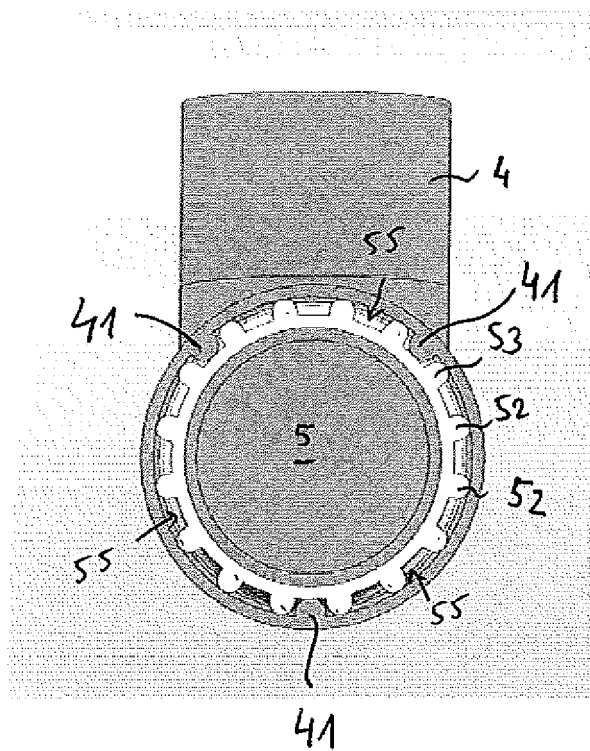


FIG. 14

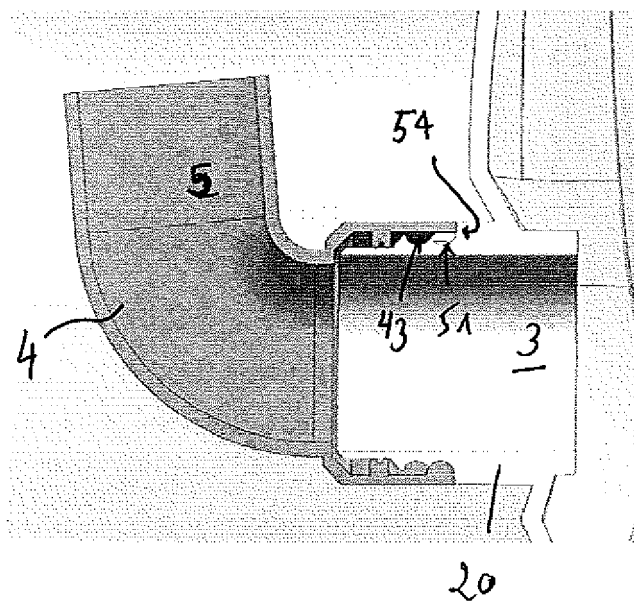


FIG. 15



EUROPEAN SEARCH REPORT

Application Number
EP 10 19 5021

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			A61M
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 June 2011	Examiner Böttcher, Stephanie
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